



PATENT  
8947-000074/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELLANTS: Young-Doug KIM et al.      CONF. NO.: 5936  
SERIAL NO.: 10/737,124      GROUP: 2111  
FILED: December 17, 2003      EXAMINER: Khanh Dang  
FOR: AN ARBITER, A SYSTEM AND A METHOD FOR GENERATING A PSEUDO-GRANT SIGNAL

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December 22, 2008

REASONS FOR PRE-APPEAL REQUEST FOR REVIEW

Dear Sir:

Further to the concurrent filing of the attached Notice of Appeal, the following remarks are submitted in connection with the above-identified patent application under the Pre-Appeal Brief Review. Claims 1-43 are pending in the present application.

Review is requested for the rejection of claims 1-10 and 13-43 under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,393,506 ("Kenny"). Appellants' incorporate by reference the contents of Appellants' August 1, 2008 Response. The arguments set forth therein are believed to remain valid. Below, Appellants will mainly address the Examiner's rebuttal set forth in the outstanding Office Action.

On pages 12-14 of Appellants' August 1, 2008 Response, Appellants argued the following in support of the patentability of claim 1 over Kenny. (*emphasis in original*).

... if the arbiter 4 of *Kenny* need not arbitrate between requesting masters (as suggested by the Examiner), then the arbiter 4 of *Kenny* does not "*perform arbitration* based on the information on the target slave unit for each requesting master unit by using the information on the target slave unit for each requesting master unit *to determine a priority of bus ownership for the requesting master units,*" as required by claim 1.

Moreover, even assuming *arguendo* that the arbitration performed by the arbiter 4 of *Kenny* depends from the address of the target and/or priority of the target from the requesting master as suggested by the Examiner (which Applicant does not admit), such information still does not constitute the "transaction information," of claim 1 because this information is received *prior to the grant of the virtual channel*, but not "*in response to,*" the grant of the virtual channel. See, *Kenny* at 6:63 - 7:4.

Thus, assuming the grant of the virtual channel in *Kenny* is similar to the "pseudo-grant signals," in claim 1 (which Applicant does not admit) and the arbitration performed by

the arbiter 4 of *Kenny* also depends from the address of the target and/or priority of the target from the requesting master (which Applicant also does not admit), *Kenny* still fails to disclose or fairly suggest "*at least one interface for generating pseudo-grant signals to all requesting master units beginning at the same time and for receiving transaction information from all requesting master units in response to the pseudo-grant signals,*" as required by claim 1.

In response, page 12 of the Office Action states in-part (**emphasis** in original):

... it is important to note that a "pseudo-grant signal" is not an actual grant signal from an arbiter. The "pseudo-grant signal" is a pre-grant signal provided to each of the requesting master units. The only difference between the claimed subject matter [and] that of *Kenny* is that *Kenny* does not explicitly disclose that the pseudo-grant signal is provided to each requesting master unit at the same time... [By] using pre-designating virtual channels and priorities for each module, the arbiter 4 does not have to arbitrate between the requesting masters having different priority, and assign a virtual channel to a requesting master according to its priority. However, it is important to note that actual arbitration must also need the information from the requesting master. The information from the master includes address of the target and/or priority of the target. See at least column 5, lines [57-63]; column 6, line 58 to column 7, line 65.

Appellants disagree with the above-statement and continue to disagree with the current rejection for the following reasons.

The statement that the "only difference between the claimed subject matter [and] that of *Kenny* is that *Kenny* does not explicitly disclose that the pseudo-grant signal is provided to each requesting master unit at the same time," is not completely correct, because that is not the only difference between claim 1 and *Kenny*.

Claim 1 requires, *inter alia*, "at least one interface for *generating pseudo-grant signals to all requesting master units beginning at the same time and for receiving transaction information from all requesting master units in response to the pseudo-grant signals.*" At least this entire feature is also not disclosed or suggested by *Kenny*. Moreover, *Kenny* does not disclose any "pseudo-grant signal" whatsoever.

Referring to FIG. 5 of *Kenny*, at step 40 *master module 5 initializes bus access by asserting address and bus request signals on the bus 11*, the address signal being an address of the target slave. At steps 41 and 42, arbiter 4 and the slave module 6 detect the address and request signals asserted by the master module. *Also at step 42, arbiter 4 identifies the master module making the request, determines the master module's priority, and grants a virtual channel.* At step 43, the assignment of virtual channel is entered into an "in service" table. At step 44, the slave module acknowledges the virtual channel grant. At step 45, the slave module asserts a channel ready signal to indicate that it is ready to read data from data bus 2 or to write data onto data bus 2.

Contrary to claim 1, in *Kenny* the master module 5 **initializes bus access by asserting an address and bus request signal (ADD/REQ) on the bus 11.** Only after receiving the address and bus request signal does the arbiter 4 respond by asserting a grant signal to the requesting master module 5. *Kenny* does not disclose (either explicitly or implicitly), that the arbiter 4 asserts any signal prior to receiving the address

and bus request signal (ADD/REQ) from the master module 5. Indeed, Kenny utilizes the term "initializes" to refer to the assertion of the address and bus request signals from the master module 5, which indicates this to be the *first or initial step in the process*. The logical conclusion from the use of the term "initialize" is that the master module 5 asserts the address and bus request signals *prior to* receiving any signals from the arbiter 4, let alone, a "pseudo-grant signal."

FIG. 6 of Kenny shows a state diagram of the virtual channel assignment protocol in conjunction with FIG. 5. Referring to FIG. 6, the arbiter 4 begins in an initial state 47, and transitions to state 48 *upon detecting master module A's assertion of the ADD/REQ signal*. In response to receiving the ADD/REQ signal, the arbiter 4 asserts grant signal GNT CHNLA on address bus 3 to indicate assignment of a virtual channel ("virtual channel A") to master module A, according to either master module A's pre-assigned virtual channel and priority, or according to an allocation procedure, as discussed above. After asserting signal GNT CHNLA, arbiter 4 returns to its initial state 47 to wait for the next ADD/REQ signal.

As was the case with FIG. 5 of Kenny, FIG. 6 also illustrates the transition of the arbiter 4 from an initial state 47 to state 48 in response to the address and bus request signal (ADD/REQ) from a master module. Kenny does not disclose that the arbiter 4 asserts any signals (grant, pseudo-grant or otherwise) in the initial state 47 prior to receiving the address and bus request signal (ADD/REQ) from the master module.

In sum, at most FIGS. 5 and 6 of Kenny disclose that the master module asserts the address and bus request signal ADD/REQ to initialize the master module's bus access and *prior to* receiving any signal (either grant, pseudo-grant or otherwise) from the arbiter 4. By contrast, in claim 1, the at least one interface of the arbiter receives, "*transaction information from all requesting master units in response to the pseudo-grant signals,*" wherein "*the transaction information includes information on at least one target slave unit for each requesting master unit.*" The arbiter 4 of Kenny surely cannot be said to receive information on at least one target slave unit in response to a pseudo-grant signal if the arbiter does not assert any signal prior to receiving the address and request signal ADD/REQ from the master module.

In addition to the above-discussed distinction, the Examiner's statement that Kenny differs from claim 1 in that Kenny does not disclose, "at least one interface for *generating pseudo-grant signals to all requesting master units beginning at the same time,*" as recited in claim 1. However, the Examiner's rationale as to how this is obvious in view of Kenny is flawed because Kenny fails to disclose an "pseudo-grant signal."

On page 2, the Office Action states:

It is clear that assigning concurrent ownership (bus ownership or bus grant) of a single data bus to each master by the arbiter before actual arbitration is interpreted as providing a pseudo bus grant signal by the arbiter to each master.

Despite the Examiner's broad and unreasonable interpretation of both Kenny, and the language of claim 1, the fact remains that Kenny fails to disclose any the asserting of any pseudo-grant signal. The

arbiter 4 of Kenny utilizes a priority scheme to determine the order in which virtual channels are granted to a particular master slave pair. In one embodiment, the arbiter 4 uses virtual channel control information (e.g., addresses of the master/slave pair, their priority, and their virtual channel assignment) stored in a register at the arbiter 4 to grant a virtual channel to a particular master/slave pair in response to address and request signals from the master module 5. See, Kenny at 5:56-5:63, 7:1-7:11. The pre-storing or pre-determining of particular virtual channels and priorities for each master/slave pair surely cannot be interpreted to constitute the claimed "*generating pseudo-grant signals to all requesting master units beginning at the same time*," of claim 1 because such a disclosure does not involve generation of any signal, let alone a pseudo-grant signal.

Moving forward, as noted above, the Office Action further states: "it is important to note that actual arbitration must also need the information from the requesting master. The information from the master includes address of the target and/or priority of the target." It is true that the arbiter 4 receives information from the requesting master module 5, but again, this information (including an address of a target slave) is received by the arbiter 4 from the master before the arbiter 4 asserts any signal to the master module 5.

Still further, beginning on page 14 of Appellants' August 1, 2008 Response, Appellants argued:  
... in rejecting claim 1 the Examiner alleges that the arbiter 4 of *Kenny* "receives transaction information from all requesting master units *in response to* the pseudo-grant signals," relying upon the disclosure that arbiter 4 returns to its initial state 47 to wait for the next ADD/REQ signal after asserting signal GNT CHNLA from each of the requesting master units. Office Action at 7. Applicants disagree with this conclusion.

Referring to FIG. 6 of *Kenny*, upon detecting the ADD/REQ signal from the master module A, the arbiter 4 asserts grant channel A signal GNT CHNLA on address bus 3 to assign a virtual channel to master module A. *Kenny* at 7:34-7:37. After transmitting the virtual grant channel A signal GNT CHNLA, arbiter 4 returns to its initial state 47 to wait for the next ADD/REQ signal. *Id.* at 41-42. But, the next ADD/REQ signal received by the arbiter 4 is independent of – not in response to – the grant channel A signal GNT CHNLA signal from the arbiter 4. Thus, contrary to claim 1, the arbiter 4 issues a virtual channel grant (grant channel A signal) GNT CHNLA in response to a ADD/REQ signal from a master module 4, but does not receive "*transaction information from all requesting master units in response to the pseudo-grant signals.*"

In response, page 13 of the Office Action states:

... it is clear from *Kenny*, particularly Fig. 6 [...] that the next ADD/REQ is not independent. As a matter of fact, the next ADD/REQ would not be sent to the master if the GNT without reception of the GNT signal. In other words, ADD/REQ (transaction information) from requesting masters is sent to the arbiter in response to the pseudo-grant signals.

While the above-statement is not completely clear, Appellants believe the underlying assertion is still flawed. Firstly, the ADD/REQ signal is not sent from the arbiter 4 to the master module 5, but **received from the master module 5 by the arbiter 4**. It appears that the above-statement is intended to express the belief that the master module 5 would not send the next ADD/REQ without having first received the GNT

signal from the arbiter 4. But, such a statement contradicts the initial functionality of Kenny in which the ADD/REQ signal *initializes* bus access, and is sent **prior to** receiving any grant signal from the arbiter 4. In the context of Kenny, the arbiter 4 awaits a next ADD/REQ signal, and (upon receipt) determines whether to de-assert the granted channel based on priority. Again, however, Kenny does not disclose that the subsequent ADD/REQ signal is in any way related to (and thus is not in response to) the prior grant signal from the arbiter 4.

For at least the foregoing reasons, Appellants respectfully submit that Kenny does not disclose or even fairly suggest at least, "at least one interface for *generating pseudo-grant signals to all requesting master units beginning at the same time and for receiving transaction information from all requesting master units in response to the pseudo-grant signals,*" as required by claim 1, and thus, fails to render claim 1 obvious. *Kenny* fails to render claims 14, 26 and 43 obvious for at least reasons somewhat similar to those set forth above with regard to claim 1. Claims 2-10, 13, 15-18, 20-25 and 27-42 are patentable over *Kenny* at least by virtue of their dependency from their respective independent claims.

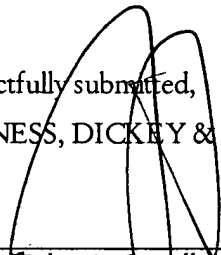
**Review is requested for the rejection of claims 11 and 12 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kenny.** Appellants do not necessarily agree with the Examiner's statements on pages 9-10 of the Final Office Action. Regardless, however, claims 11 and 12 are patentable at least by virtue of their dependency from claim 1. Thus, withdrawal of this rejection is requested.

In view of the remarks, reconsideration of the objections and rejections and allowance of each of the pending claims in connection with the present application is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Pre-Appeal Brief Review Board is respectfully requested to contact the undersigned at the telephone number. If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,  
HARNES, DICKEY & PIERCE, PLC

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<b>PRE-APPEAL BRIEF REQUEST FOR REVIEW</b>	Docket Number (Optional) 8947-000074/US
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	First Named Inventor Young-Doug KIM et al.	
	Art Unit 2111	Examiner Khanh Dang

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).  
Note: No more than five (5) pages may be provided.

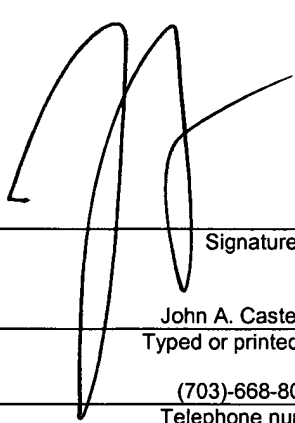
I am the

applicant/inventor

assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

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 \_\_\_\_\_  
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NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below\*.

\*Total of \_\_\_\_\_ forms are submitted.